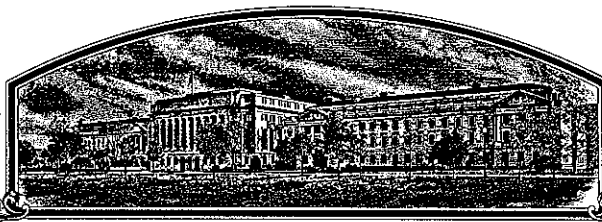


No.

8200191



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Purdue University Agricultural
Experiment Station and USDA-ARS
Whereas, THERE HAS BEEN PRESENTED TO THE
Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, [THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM* TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS PROVIDED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

*[Waived, except that this waiver shall not apply
to breeder seed, foundation seed, WHEAT
labeling requirements, and
blending limitations.]

'Fillmore'



Attest

Kenneth H. ...
Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

In Testimony Whereof, I have hereunto set
my hand and caused the seal of the Plant
Variety Protection Office to be affixed
at the City of Washington
this 26th day of July in
the year of our Lord one thousand nine
hundred and eighty-five.

John R. ...
Secretary of Agriculture

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

INSTRUCTIONS: See Reverse.

No certificate for plant variety protection may be issued unless a completed application form has been received (5 U.S.C. 553).

1a. TEMPORARY DESIGNATION OF VARIETY <u>Purdue 65256A1-9-7</u>		1b. VARIETY NAME <u>Fillmore</u>		FOR OFFICIAL USE ONLY PV NUMBER 8200191	
2. KIND NAME <u>Wheat</u>		3. GENUS AND SPECIES NAME <u>Triticum aestivum</u>		FILING DATE <u>9/29/82</u>	TIME AM PM <u>2:00</u>
4. FAMILY NAME (BOTANICAL) <u>Gramineae</u>		5. DATE OF DETERMINATION <u>June 15, 1982</u>		FEE RECEIVED \$ <u>500.00</u> \$ <u>250.00</u>	DATE <u>9/29/82</u> <u>6/27/85</u>
6. NAME OF APPLICANT(S) <u>Director, Purdue Univ. Agric. Experiment Station and ARS-USDA</u>		7. ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code) <u>Purdue University West Lafayette, IN 47907</u>		8. TELEPHONE AREA CODE AND NUMBER <u>317-494-8360</u>	
9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: (Corporation, partnership, association, etc.) <u>Agricultural Experiment Station</u>		10. IF INCORPORATED, GIVE STATE AND DATE OF INCORPORATION <u>Established by Federal Law (Hatch Act)</u>		11. DATE OF INCORPORATION <u>1889</u>	
12. NAME AND MAILING ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS: <u>Dr. B. R. Baumgardt, Director Purdue University Agricultural Experiment Station West Lafayette, IN 47907</u>					

13. CHECK BOX BELOW FOR EACH ATTACHMENT SUBMITTED:

- ☒ 13A. Exhibit A, Origin and Breeding History of the Variety (See Section 52 of the Plant Variety Protection Act.)
- ☒ 13B. Exhibit B, Novelty Statement.
- ☒ 13C. Exhibit C, Objective Description of the Variety (Request form from Plant Variety Protection Office.)
- ☒ 13D. Exhibit D, Additional Description of the Variety.

14a. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See Section 83(a). (If "Yes," answer 14B and 14C below.) ☒ YES ☐ NO

14b. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
☒ YES ☐ NO

14c. IF "YES," TO 14B, HOW MANY GENERATIONS OF PRODUCTION BEYOND BREEDER SEED?
☒ FOUNDATION ☒ REGISTERED ☒ CERTIFIED

15a. DID THE APPLICANT(S) FILE FOR PROTECTION OF THIS VARIETY IN OTHER COUNTRIES? ☐ YES ☒ NO (If "Yes," give name of countries and dates.)

15b. HAVE RIGHTS BEEN GRANTED THIS VARIETY IN OTHER COUNTRIES? ☐ YES ☒ NO (If "Yes," give name of countries and dates.)

16. DOES THE APPLICANT(S) AGREE TO THE PUBLICATION OF HIS/HER (THEIR) NAME(S) AND ADDRESS IN THE OFFICIAL JOURNAL? ☐ YES ☒ NO

17. The applicant(s) declare(s) that a viable sample of basic seed of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

Sept 7, 1982
(DATE)

B. R. Baumgardt
(SIGNATURE OF APPLICANT)

(DATE)

(SIGNATURE OF APPLICANT)

13A. Exhibit A, Origin and Breeding History of the Variety.

Fillmore (PI 469272) was developed by the Purdue University Agricultural Experiment Station in cooperation with ARS, U.S. Department of Agriculture. Fillmore resulted from a backcross of Siete Cerros to a Purdue parental line. The parentage is P5724B3-5P-8-2*2/Siete Cerros. P5724B3-5P-8-2 and Benhur were derived from the same cross. The parentage of Benhur has been published (Crop Sci. 17:527-528). Fillmore and Caldwell were selected from progeny of the same backcross F_1 plant. The pedigree and temporary selection number of Fillmore was Purdue 65256A1-9-7.

Following the backcross the new variety was developed by the modified pedigree method of breeding with plant selections made in the F_1 , F_2 , and F_8 generations. In 1978, in the F_{13} generation of selfing, 98 of 100 individual plant progeny rows, judged uniform and similar, were composited for breeders' seed. Breeder's seed in 1981 was in the F_{16} generation of self-pollination.

Fillmore has been tested for performance in advanced nursery yield trials for 5 years, 1976 to 1981; in intra-state drill plot trials for 3 years, 1979 to 1981, and in the regional Uniform Eastern Soft Red Winter Wheat Performance Nursery for two years, 1980 and 1981.

Soft wheat quality has been evaluated from intra-state drill plots, 1979 and 1980, and from nursery plots, 1976 to 1980.

Fillmore has been true breeding in our observations during breeders' seed development, 1978 to 1981.

The height of Fillmore plants is influenced by microenvironmental factors. Often a single tiller, sometimes two, may grow 5 to 10 cm taller than the average. A tall single tiller is frequent and typical in Fillmore.

13A. Exhibit A for Fillmore (cont.)

Fillmore has less than one percent of plants with a green rather than a yellow-green spike at flowering. These are generally 10 to 15 cm taller than the average plants of Fillmore. No other variants have been observed in Fillmore. We consider Fillmore to be true-breeding.

13B. Exhibit B, Novelty Statement for Fillmore (Revised May, 1985).

Fillmore is a soft red winter wheat variety with a unique combination of mid-season maturity, high milling and baking quality, and resistance to diseases and to Hessian fly.

Fillmore is most like Caldwell but averages five days later in maturity and 7cm taller (Tables 1, 2, 3, 4, and 5) and has a strap shape spike versus the tapering spike of Caldwell.

Fillmore and Caldwell presumably have many genes in common since they were derived from the same F_1 plant following the three-way cross. Fillmore and Caldwell have a similar level of only moderate winterhardiness (Table 11). Fillmore, like Caldwell, is intermediate in reaction to soil-borne mosaic, moderately susceptible to wheat spindle streak mosaic, and moderately resistant to barley yellow dwarf (Table 6).

Fillmore has the same genetic source of resistance to septoria tritici leaf blotch as Caldwell and has a generally similar level of resistance (Table 7). Fillmore and Caldwell have similar high levels of resistance to powdery mildew, leaf rust, and stem rust in the adult plant stage (Tables 8, 9 and 10).

Fillmore and Caldwell have the H6 gene for resistance to Hessian fly biotypes GP, A, B, E, H, I, J, and M. H6 does

not give resistance to biotypes C, D, F, G, K, L, N, and O. No other resistance gene gives these exact reactions to the 16 biotypes of Hessian fly. The H6 gene was derived from the spring durum wheat PI94587 and was first used in a soft red winter wheat variety in 1962 in the Knox 62 variety.

The soft red winter wheat varieties with the H6 gene represent a unique group of varieties different from all other varieties. These and references to descriptions include:

Early maturing varieties:

Crop Science

Knox 62	18:527, 1978.
Benhur	18:527, 1978.
Caldwell	22:691-692, 1982.

Brown glumed variety:

Key	18:1096, 1978.
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Very winterhardy variety:

Auburn	22:161, 1982.
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Variety susceptible to leaf rust:

Massey	24:1000, 1984
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Awned varieties:

Dancer
Pioneer S76

The above varieties can easily be differentiated from Fillmore. Fillmore is mid-season in maturity whereas Knox 62, Benhur, and Caldwell are early like Arthur, several days earlier than Fillmore (Table 1). Key has brown glumes whereas Fillmore has yellow glumes. Auburn is very

winterhardy whereas Fillmore is moderate in winterhardiness (Table 11). Massey is susceptible to leaf rust and has a tapering spike whereas Fillmore is resistant to leaf rust and has a strap-shaped spike. Dancer and Pioneer 576 are awned whereas Fillmore has awnlets. In summary, Fillmore is unique from all other soft red winter wheat varieties which also have the H6 gene for resistance to Hessian fly. Fillmore, with the H6 gene, is unique from all varieties which do not have the H6 gene.

Table 1. Comparative performance in nursery yield trials at Lafayette, Indiana, 1976 - 1981.

Variety	Yield bu./A (5)*	Test wt. lb./bu. (5)	Kernel wt. g/1000 (3)	Headed May (6)	Height in. (6)	Pre-ripe straw score** (5)	Post-ripe straw score** (1979)
Fillmore	76.8	59.5	32.9	26.3	38.3	3.5	3.0
Caldwell	81.0	58.0	30.1	21.3	35.5	3.0	4.0
Auburn	77.2	59.2	31.0	24.0	36.0	3.0	3.0
Redcoat	54.8	59.2	36.8	27.7	44.0	4.2	2.5
Beau	71.4	59.9	36.3	22.7	35.7	3.9	4.5
Arthur	71.7	59.0	33.6	20.0	37.2	4.7	6.0
Sullivan	68.1	59.4	34.5	20.5	37.0	4.5	5.5
S. E.†	1.82	0.38	0.82	0.55	0.64	0.41	—

*Number of years in a mean or specific year of data. Yields were not measured in 1978 because of severe winterkilling.

**Straw scored from 0 = erect to 9 = lodged flat.

†S. E. Standard error of the difference between variety means.

Table 2. Porter County (northwestern Indiana) winter wheat performance trials.**

Variety	Acre yield	Test wt.	Loos- ing	Plant ht.	Winter kill	Date headed
	bu.	lb./bu.	%	in.	%	
Three-Year Average, 1979-81						
Fillmore	75.1	60.3	5	37	4	6-1
Auburn	78.8	60.5	5	36	3	6-1
Roland	71.2	58.9	10	34	3	6-1
Titan	71.1	57.9	13	39	2	6-4
Beau	69.6	61.0	8	37	3	6-1
Arthur	69.2	60.5	24	39	3	5-31
Hart	69.2	59.8	9	39	2	6-1
Sullivan	66.2	60.6	26	38	3	5-31
Arthur 71	65.5	60.4	25	38	2	6-1
Monon	61.8	59.3	28	42	2	5-30
BLSD*	7.3					
C. V.	4.3%					
Two-Year Average, 1980-81						
Fillmore	77.4	60.0	8	38	3	6-1
Auburn	80.3	59.9	7	37	3	6-1
Caldwell	78.5	57.6	19	37	2	5-31
Pike	73.7	58.3	18	39	2	5-31
Hart	72.3	59.5	13	41	2	5-31
Beau	71.5	60.8	11	39	3	5-31
Titan	70.5	57.2	19	40	2	6-3
Roland	70.1	58.5	16	36	2	6-1
Arthur	69.2	60.2	36	40	3	5-31
Arthur 71	65.3	60.0	37	40	2	5-31
Sullivan	64.5	60.3	39	40	3	5-31
Monon	60.4	58.7	43	44	3	5-29
BLSD*	9.6					
C.V.	4.3%					

*Bayes LSD test, K = 100.

**Data from performance trials of K. M. Day and reported in part in Purdue Agric. Exp. Stn. Bull. No. 340, 1981.

Table 3. Tippecanoe County (west central Indiana) winter wheat performance trials.*

Variety	Acre yield	Test wt.	Lodg- ing	Plant ht.	Winter kill	Date headed
	bu.	lb./bu.	%	in.	%	
Three-Year Average, 1979-81						
Fillmore	86.4	60.2	0	42	0	5-29
Auburn	84.6	59.9	0	40	0	5-28
Roland	83.2	58.6	4	38	0	5-29
Hart	82.4	58.7	8	42	0	5-27
Titan	81.3	57.7	9	44	0	6-1
Sullivan	79.4	59.6	19	42	0	5-26
Beau	78.7	59.9	4	41	0	5-28
Arthur	77.5	59.4	19	43	0	5-26
Arthur 71	77.1	59.7	26	43	0	5-27
Monon	69.7	58.1	41	45	0	5-24
BLSD*	6.2					
C.V.	3.9%					
Two-Year Average, 1980-81						
Fillmore	88.3	60.5	0	41	0	5-27
Caldwell	88.8	58.3	11	40	0	5-26
Pike	83.7	59.2	11	42	0	5-27
Auburn	83.0	60.4	0	41	0	5-27
Hart	79.8	59.2	13	43	0	5-26
Roland	77.3	59.2	6	38	0	5-28
Sullivan	76.5	59.8	24	42	0	5-25
Titan	75.4	57.9	10	44	0	5-30
Beau	74.9	60.2	6	41	0	5-27
Arthur	72.2	59.8	26	44	0	5-25
Arthur 71	71.9	60.1	30	43	0	5-26
Monon	63.0	58.1	44	45	0	5-24
BLSD*	7.8					
C.V.	4.3%					

*Bayes LSD test, K = 100.

**Data from the trials of O. W. Luetkemeier and published in part in Purdue Univ. Agric. Exp. Stn. Bull. No. 340, 1981.

Table 4. Randolph County (east central Indiana) winter wheat performance trials.**

Variety	Acre yield	Test wt.	Lodg- ing	Plant ht.	Winter kill	Date headed
	bu./A	lb./bu.	%	in.	%	
Three-Year Average, 1979-81						
Fillmore	65.7	58.6	16	40	1	5-30
Titan	68.9	57.3	16	42	2	6-1
Hart	67.9	57.9	9	41	1	5-27
Auburn	66.8	58.6	11	40	1	5-29
Roland	65.1	57.3	10	36	1	5-29
Beau	62.1	58.9	18	39	1	5-27
Arthur	61.3	58.0	23	40	1	5-26
Sullivan	60.2	58.5	25	40	1	5-25
Arthur 71	57.9	58.7	23	40	2	5-26
Monon	53.0	56.8	42	42	1	5-25
BLSD*	8.5					
C.V.	6.1%					
Two-Year Average, 1980-81						
Fillmore	58.7	57.4	16	39	0	5-28
Caldwell	63.3	54.5	16	38	0	5-27
Pike	61.9	57.0	21	38	1	5-27
Titan	61.7	56.2	24	42	0	5-31
Auburn	61.4	57.5	16	40	0	5-28
Hart	61.1	57.3	13	42	1	5-26
Roland	58.8	56.3	15	37	0	5-28
Beau	54.4	58.0	27	39	0	5-27
Arthur	52.6	56.8	31	41	1	5-26
Arthur 71	51.8	57.8	31	41	0	5-26
Sullivan	51.7	57.5	34	41	0	5-26
Monon	42.2	55.4	43	42	1	5-27
BLSD*	15.4					
C.V.	7.1%					

*Bayes LSD test, K = 100

**Data from performance trials of K. M. Day and reported in part in Purdue Univ. Agric. Exp. Stn. Bull. No. 340. 1981.

Table 5. Knox County (southwestern Indiana) winter wheat performance trials.**

Variety	Acre yield	Test wt.	Logg- ing	Plant ht.	Wint kill
	bu./A	lb./bu.	%	in.	%
Two-Year Average, 1979-80					
Fillmore	71.3	58.4	1	41	5
Hart	84.5	58.3	2	42	3
Titan	78.3	57.2	6	43	5
Arthur	75.2	59.7	21	42	3
Roland	73.5	57.4	1	36	4
Beau	72.6	60.2	0	40	6
Auburn	71.7	58.9	0	40	4
Sullivan	70.3	59.7	23	42	4
Arthur 71	69.8	59.6	24	41	4
Monon	66.2	58.4	44	44	3
BLSD*	7.6				
C.V.	5.1%				

*Bayes LSR test, K = 100.

**Data from performance trials of K. M. Day and reported in part in Purdue Univ. Ag Exp. Stn. Bull. No. 340, 1981.

Table 6. Comparative reactions to virus diseases of wheat varieties in disease nurseries 1976 - 1981.*

Variety	Soil-borne mosaic (6)**	Spindle streak		Barley yellow dwarf	
		(1981)	(1979)	(3)	(4)
Fillmore	5.2	6.0	6.0	3.5	4.6
Caldwell	5.5	6.1	5.5	4.0	3.6
Auburn	4.6	6.2	4.5	5.7	5.7
Redcoat	6.3	---	6.0	6.5	---
Monon	1.9	3.0	2.0	4.3	4.6
Beau	4.3	4.0	7.0	6.0	5.5
Arthur	4.2	---	6.0	5.5	---
Sullivan	3.6	---	3.0	6.3	---
Vigo	---	---	5.5	5.3	---
Ruler	---	---	3.0	---	---
Titan	---	---	3.0	---	---
Abe	---	4.5	6.0	6.1	6.1
Hart	---	3.0	3.0	4.3	4.0
S.E.†	0.52				

*Reactions to all diseases are scored from 0 = immune to 9 = very susceptible.

**Number of years' data in mean or specific year of data.

†Standard error of the difference between variety means.

Table 7. Adult plant reactions to *Septoria tritici* leaf blotch.

Variety	Severity (%) and reaction type*					
	1981†	1981‡	1980	1978	1976	1975
Fillmore	12	55	26 B	37 C	37	50 D
Caldwell	21	70	37 A	37 B	26	15 B
Auburn	26	55	26 C	37 A	10	60 B
Redcoat	55	70	26 B	37 C	55	80 D
Arthur	37	79	55 B	37 D	55	50 D
Monon	37	95	70 C	55 D	55	40 C
Oasis	16	65	70 A	55 A	26	5 A
Beau	26	70	37 B	55 C	26	5 B
Benhur	--	--	37 C	37 C	37	60 D

*Severity rated as percent of upper four leaves necrotic. Reaction type:

A = no pycnidia in lesions to D = abundant pycnidia in lesions.

†Rated May 28, 1981.

‡Rated June 18, 1981.

Table 8. Reaction to powdery mildew in the adult stage in the field and in the seedling stage in the greenhouse.*

Variety	Percent infection in the field**				Seedling reaction in 1978 (0-4)†
	1981	1980	1979	1976	
Fillmore	Tr	0	25	Tr	4
Caldwell	3	0	15	0-5	3 ⁺
Auburn	Tr	0	3	3	4
Redcoat	5	0	40	12	4 ⁺
Beau	3	Tr	25	3	2 ⁺
Arthur	10	10	40	7	3
Sullivan	10	0	70	12	0
Oasis	15	Tr	30	7	3
Benhur	—	5	10	10	4
Monon	60	5	80	25	4
Ruler	--	--	40	Tr	4
Titan	--	--	10	8	4

*Naturally occurring races of the pathogen.

**Percent of leaf area affected.

†Plant reactions: 0 = highly resistant to 4 = large colonies with dense conidial c

A "+" indicates a more susceptible reaction within the specific numerical class.

Table 9. Leaf rust severity and reaction type at the adult plant stage in the field and to a leaf rust fungus (*Puccinia recondita*) culture virulent to the Lr 2 source of resistance in the seedling stage.*

Variety	Percent Infection and Infection type**					Seedling [†] reaction 1981
	1981	1980	1979	1978	1976	
Fillmore	5 R	0 R	2 R	0 R	0 R	3, 1 ON
Caldwell	0 R- 10 MS	0 R	5 S/1 R	2 MR/15 MS	0 R	3
Auburn	5 R	0 R	0 R	5 R	0 R	3
Redcoat	5 R	0 R	5 R	Tr R	Tr R	3
Beau	25 S	Tr MS	2 S	15 MS	7 MS	3
Arthur	30 S	20 MS	10 S	5 MS	20 MS	3
Sullivan	40 S	5 MS	1 S	0 R/10 MS	0 R	3 ⁺
Oasis	40 S	10 MS	2 S	10 MS	0 R	3
Benhur	---	Tr R	10MS-MR	10 M	20 MS	-
Monon	40 S	40 S	60 S	60 S	70 S	3
Ruler	---	---	20 S	Tr MS	Tr MS	
Titan	---	---	1 MS	10 MR	10 MR	

*To races of the pathogen occurring naturally in the field at Lafayette, IN.

**Percent of flag leaf area (modified Cobb scale) covered by uredinia;

R = resistant fleck reaction; S = large sporulating uredinia;

M = "moderately".

[†]Seedling reactions from 0 = immune to 4 = highly susceptible.

Table 10. Stem rust severity and reaction type at the adult plant stage in the field.*

Variety	Percent Infection and reaction type**	
	1979	1975
Fillmore	0 R	0 R
Caldwell	1 R	0 R
Auburn	2 MS	0 R
Redcoat	2 R	0 R
Arthur	1 MR	0 R
Oasis	Tr MR	0 R
Beau	2 MS	0 R/1 S
Benhur	Tr MR	0 R
Monon	10 MS	5 S

*To a combination of races 15TLM, 15TMN, 17HDL, 151QCB and 151QFB of Puccinia graminis tritici.

**Percent of flag leaf and peduncle area (modified Cobb scale covered by uredinia and reaction type: R = resistant fleck reaction; S = large sporulating uredinia; M = "moderately".

Table 11. Comparative winterhardness of wheat varieties in Indiana in 1978.

Variety	Winter survival (%) in nursery yield plots at Lafayette, IN*
Fillmore	39
Caldwell	36
Auburn	68
Redcoat	38
Ruler	40
Titan	48
Monon	50
Beau	60
Arthur	50
Sullivan	40
Vigo	59
Benhur	10
Hart	20
Knox 62	38
Abe	60
Oasis	40

*Average of 4 replications. The winter of 1977-78 was a very severe test for winterhardness at Lafayette, IN.

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, POULTRY, GRAIN & SEED DIVISION
BELTSVILLE, MARYLAND 20705

EXHIBIT C
(Wheat)

OBJECTIVE DESCRIPTION OF VARIETY
WHEAT (TRITICUM SPP.)

INSTRUCTIONS: See Reverse.

NAME OF APPLICANT(S)

FOR OFFICIAL USE ONLY

PVPO NUMBER

8200191

ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code)

VARIETY NAME OR TEMPORARY
DESIGNATION

Fillmore

Place the appropriate number that describes the varietal character of this variety in the boxes below.

Place a zero in first box (e.g., 0 8 9 or 0 9) when number is either 99 or less or 9 or less.

1. KIND:

1 1 = COMMON 2 = DURUM 3 = EMMER 4 = SPELT 5 = POLISH 6 = POULARD 7 = CLUB

2. TYPE:

2 1 = SPRING 2 = WINTER 3 = OTHER (Specify) 1 1 = SOFT 3 = OTHER (Specify)
2 = HARD

2 1 = WHITE 2 = RED 3 = OTHER (Specify)

3. SEASON - NUMBER OF DAYS FROM EMERGENCE TO:

2 3 3 FIRST FLOWERING 2 4 0 LAST FLOWERING

4. MATURITY (50% Flowering):

NO. OF DAYS EARLIER THAN 1 = ARTHUR 2 = SCOUT 3 = CHRIS
0 6 NO. OF DAYS LATER THAN 1 4 = LEMHI 5 = NUGAINES 6 = LEEDS

5. PLANT HEIGHT (From soil level to top of head):

0 9 6 CM. HIGH
0 3 CM. TALLER THAN 1
CM. SHORTER THAN 1 = ARTHUR 2 = SCOUT 3 = CHRIS
4 = LEMHI 5 = NUGAINES 6 = LEEDS

6. PLANT COLOR AT BOOTING (See reverse):

2 1 = YELLOW GREEN 2 = GREEN 3 = BLUE GREEN

7. ANTHUR COLOR:

1 1 = YELLOW 2 = PURPLE

8. STEM:

2 Anthocyanin: 1 = ABSENT 2 = PRESENT 2 Waxy bloom: 1 = ABSENT 2 = PRESENT
1 Hairiness of last internode of rachis: 1 = ABSENT 2 = PRESENT 1 Internodes: 1 = HOLLOW 2 = SOLID
0 4 NO. OF NODES (Originating from node above ground) 2 5 CM. INTERNODE LENGTH BETWEEN FLAG LEAF AND LEAF BELOW

9. AURICLES:

1 Anthocyanin: 1 = ABSENT 2 = PRESENT 2 Hairiness: 1 = ABSENT 2 = PRESENT

10. LEAF:

1 Flag leaf at booting stage: 1 = ERECT 2 = RECURVED 1 Flag leaf: 1 = NOT TWISTED 2 = TWISTED
3 = OTHER (Specify): 2 Waxy bloom of flag leaf sheath: 1 = ABSENT 2 = PRESENT
2 Hairs of first leaf sheath: 1 = ABSENT 2 = PRESENT
1 5 MM. LEAF WIDTH (First leaf below flag leaf) 1 8 CM. LEAF LENGTH (First leaf below flag leaf):

11. HEAD:

1 Density: 1 = LAX 2 = DENSE

2 Shape: 1 = TAPERING 2 = STRAP 3 = CLAVATE
4 = OTHER (Specify) _____

2 Awedness: 1 = AWNLESS 2 = APICALLY AWNLETED 3 = AWNLETED 4 = AWNED

2 Color at maturity: 1 = WHITE 2 = YELLOW 3 = PINK 4 = RED
5 = BROWN 6 = BLACK 7 = OTHER (Specify) _____

0 9 CM. LENGTH 1 3 MM. WIDTH

12. GLUMES AT MATURITY:

2 Length: 1 = SHORT (CA. 7 mm.) 2 = MEDIUM (CA. 8 mm.)
3 = LONG (CA. 9 mm.)

2 Width: 1 = NARROW (CA. 3 mm.) 2 = MEDIUM (CA. 3.5 mm.)
3 = WIDE (CA. 4 mm.)

3 Shoulder: 1 = WANTING 2 = OBLIQUE 3 = ROUNDED
shape: 4 = SQUARE 5 = ELEVATED 6 = APICULATE

1 Beak: 1 = OBTUSE 2 = ACUTE 3 = ACUMINATE

13. COLEOPTILE COLOR:

3 1 = WHITE 2 = RED 3 = PURPLE

14. SEEDLING ANTHOCYANIN:

2 1 = ABSENT 2 = PRESENT

15. JUVENILE PLANT GROWTH HABIT:

2 1 = PROSTRATE 2 = SEMI-ERECT 3 = ERECT

16. SEED:

1 Shape: 1 = OVATE 2 = OVAL 3 = ELLIPTICAL

1 Cheek: 1 = ROUNDED 2 = ANGULAR

1 Brush: 1 = SHORT 2 = MEDIUM 3 = LONG

1 Brush: 1 = NOT COLLARED 2 = COLLARED

3 Phenol reaction: 1 = IVORY 2 = FAWN 3 = LT. BROWN
(See instructions): 4 = BROWN 5 = BLACK

3 Color: 1 = WHITE 2 = AMBER 3 = RED 4 = PURPLE 5 = OTHER (Specify) _____

0 6 MM. LENGTH 0 3 MM. WIDTH 3 2 GM. PER 1000 SEEDS

17. SEED CREASE:

1 Width: 1 = 60% OR LESS OF KERNEL 'WINOKA'
2 = 80% OR LESS OF KERNEL 'CHRIS'
3 = NEARLY AS WIDE AS KERNEL 'LEMHI'

1 Depth: 1 = 20% OR LESS OF KERNEL 'SCOUT'
2 = 35% OR LESS OF KERNEL 'CHRIS'
3 = 50% OR LESS OF KERNEL 'LEMHI'

18. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

2 STEM RUST* 2 LEAF RUST* 0 STRIPE RUST (Races) 0 LOOSE SMUT * See tables

2 POWDERY MILDEW* 0 BUNT 2 OTHER (Specify) Septoria leaf blotch

19. INSECT: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

0 SAWFLY 0 APHID (Bydv.) 0 GREEN BUG 1 CEREAL LEAF BEETLE

OTHER (Specify) _____ HESSIAN FLY RACES: 2 GP 2 A 2 B 1 C
1 D 0 E 0 F 0 G

20. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering	Arthur	Seed size	Arthur
Leaf size	Beau	Seed shape	Arthur
Leaf color	Abe	Coleoptile elongation	Arthur
Leaf carriage	Abe	Seedling pigmentation	Arthur

INSTRUCTIONS

GENERAL: The following publications may be used as a reference aid for the standardization of terms and procedures for completing this form:

(a) L.W. Briggie and L. P. Reitz, 1963, Classification of Triticum Species and Wheat Varieties Grown in the United States, Technical Bulletin 1278, United States Department of Agriculture.

(b) W.E. Walls, 1965, A Standardized Phenol Method for Testing Wheat Seeds for Varietal Purity, contribution No. 28 to the handbook of seed testing prepared by the Association of Official Seed Analysts. (See attachment.)

LEAF COLOR: Nickerson's or any recognized color fan should be used to determine the leaf color of the described variety.

13D. Exhibit D, Description of Additional Characteristics

Fillmore has excellent straw strength and standing ability. It is similar to Caldwell, Auburn and Beau in these characters (Table 1). Test weight of grain is excellent and similar to that of Arthur and Sullivan (Table 1). Fillmore has good commercial milling and baking qualities (Tables 12 and 13).

The anther color of Fillmore is generally yellow but a slight purple tinge is present on some anthers. The stem has a slight waxy bloom. Anthocyanin pigment is usually absent in the auricles and auricles have few to no hairs. The flag leaf sheath has a slightly waxy bloom.

The coleoptile of Fillmore has a light purple streak like that of Arthur. Seedling anthocyanin pigment generally occurs on the lower leaf sheaths.

The kernel brush is not clearly collared but a slight collar may occur on the crease side of the kernel.

Probably the easiest approach to proving the uniqueness of Fillmore is to begin with the H6 gene for resistance to the Hessian fly. Only a few other varieties have this gene. The other varieties with the H6 gene are all very different from Fillmore. These differences are detailed in Exhibit B.

Table 12. Quality characteristics of wheat varieties as determined by the Soft Wheat Quality Laboratory, Wooster, OH, from intrastate drill plot composite samples for the 1979 crop.*

Variety	Milling	Baking	Mill-	Cookie		Cake	
	quality	quality	ability	diameter	score	volume	score
	score	score	score	(cm)		(cm ³)	
Fillmore	109.3A [†]	95.9B	128.0	17.8	6	1113	89
Arthur**	100.0A	100.0A	114.8	17.9	5	1097	87
Monon	103.5A	84.1E	119.4	17.6	4	1088	84
Abe	93.9C	91.2C	103.4	18.0	5	1078	86
Oasis	95.9B	91.9C	107.9	17.8	6	1114	88
Beau	91.1C	89.4D	101.0	17.8	5	1137	87
Sullivan	93.8C	99.8B	105.1	18.1	6	1121	88
Hart	100.8A	80.8E	116.7	17.4	3	1109	82
Roland	99.8B	102.2A	111.9	18.1	6	1134	89
Titan	92.3C	85.9D	103.2	17.8	6	1096	83
Auburn	109.3A	95.9B	128.0	18.0	6	1113	81

*Twenty pound samples

**Standard variety for comparisons.

†Letters following scores indicate quality classifications in relation to the standard variety.

Table 13. Quality characteristics of wheat varieties as determined by the Soft Wheat Quality Laboratory, Wooster, OH from intrastate drill plot composite samples for the 1980 crop

Variety	Milling quality	Baking quality	Mill- ability	Cookie		Cake	
	score	score	score	diameter cm	score	volume (cm ³)	score
Fillmore	102.0A [†]	101.7A	116.3	17.7	6	1091	86
Caldwell	109.9A	102.9A	122.5	17.8	6	1090	82
Arthur**	96.8B	101.7A	109.8	17.7	6	1085	85
Monon	100.0A	100.0A	113.3	17.4	6	1112	87
Abe	86.4D	103.7A	91.8	17.6	5	1140	86
Beau	87.4D	92.4C	95.0	17.5	5	1116	83
Sullivan	91.2C	106.2A	100.9	17.8	6	1137	86
Downy	92.2C	96.7B	102.1	17.5	7	1093	84
Hart	89.3D	92.1C	98.1	17.6	5	1081	82
Auburn	101.5A	99.8B	115.6	17.6	5	1072	83

*Twenty pound samples composited from four test locations in Indiana.

**Standard for comparisons.

†Letters following scores indicate quality classifications in relation to the standard variety.

**PURDUE
UNIVERSITY****OFFICE OF THE DIRECTOR
Agricultural Experiment Station**

February 9, 1983

Dr. Kenneth Evans
Acting Commissioner
Plant Variety Protection Office
U. S. Department of Agriculture
National Agricultural Library Building
Beltsville, Maryland 20705

Dear Ken:

During the past few months we have submitted plant variety protection applications for "Fillmore Wheat" and "Porter Oats". These are both varieties that have been developed jointly by ARS and Purdue University Ag Experiment Station scientists. Thus, the usual requirement for waiver rights apply. However, we are hereby requesting that the waiver statement be revised to read as follows:

"The rights to exclude others from selling the variety, or offering it for sale, or reproducing it, or importing it, or exporting it, or using it in producing a different variety therefrom are waived, except that the waiver shall not apply to breeder seed, foundation seed, labelling requirements, and blending limitations established by the owners."

In our opinion it is important that the exemptions to the waiver be stated on the plant variety protection certificate so that it is clear to all interested parties that the owners have retained the rights to regulate the use of breeder seed, foundation seed, and establish blending requirements. The failure to have these exemptions to the waiver stated on the certificates in the past has, in our opinion, caused confusion among our seedsmen and has resulted in some of the blending problems that I discussed with you when you visited Purdue last fall.

Best regards.

Sincerely,


V. L. Lechtenberg
Associate Director

VLL/sy



Agricultural Administration Building
West Lafayette, Indiana 47907